Patent Claims

1. A steam turbine (20) having a rotor (21), which is provided with a number of rotor blades (22) and, together with a number of guide vanes (24), is arranged inside a casing shell (23) formed from a number of casing segments, at least one of the casing segments being provided with a number of integrated cooling channels (29).

2. The steam turbine (20) as claimed in claim 1, in which the or each cooling channel (29) is positioned inside the wall of the corresponding casing segment, offset toward the inner surface relative to the center plane of said wall.

3. The steam turbine (20) as claimed in claim 1 or 2, in which the or each cooling channel (29) is oriented substantially in the longitudinal direction of the rotor (21).

4. The steam turbine (20) as claimed in one of claims 1 to 3, in which the rotor blades (22) and guide vanes (24) are combined to form a number of blade/vane rows, the or each cooling channel (29) extending over at least two, preferably more, successive blade/vane rows, as seen in the longitudinal direction of the rotor (21).

5. The steam turbine (20) as claimed in one of claims 1 to 4, in which the cooling channels (29) are combined to form a common cooling system which is integrated in the casing shell (23).

6. The steam turbine (20) as claimed in claim 5, the cooling system of which comprises a number of branch channels oriented in the circumferential direction of the corresponding casing segment.

7. The steam turbine (20) as claimed in claim 5 or 6, to the casing shell (23) of which a number of guide vanes (24), which can each be cooled via an integrated branch channel connected to the cooling system, are attached.

8. The steam turbine (20) as claimed in one of claims 1 to 7, in which the or each cooling channel (29) is connected, via a number of overflow openings, to a flow space, surrounded by the casing shell (23), for a flow medium.

9. The steam turbine (20) as claimed in claim 8, in which the respective cooling channel (29) and the overflow openings are dimensioned in such a manner that in the operating state the coolant is at a slightly higher pressure than the flow medium.

10. The steam turbine (20) as claimed in claim 9, in which the or each cooling channel (29) has at least one overflow opening for each turbine stage.

11. The steam turbine (20) as claimed in one of claims 1 to 10, in which the or each cooling channel (29) can be supplied with steam as coolant.

12. A method for operating a steam turbine (20), in particular the steam turbine as claimed in one of claims 1 to 10, in which a casing shell (23) which delimits the flow space for the flow medium is at least partially acted on by coolant via a number of integrated cooling channels (29).

13. The method as claimed in claim 12, in which the coolant is guided in a combined cooling system formed by the cooling passages (29).

14. The method as claimed in claim 12 or 13, in which the coolant, from the cooling passages (29), is admixed to the flow medium.

15. The method as claimed in claim 14, in which the coolant is fed into the flow medium at a pressure which is more than the pressure prevailing in the flow medium at the corresponding mixing location.

16. The method as claimed in one of claims 12 to 15, in which the coolant is guided at a pressure which, as seen in the longitudinal direction of the rotor (21), is matched to the pressure prevailing locally in the flow space of the flow medium.